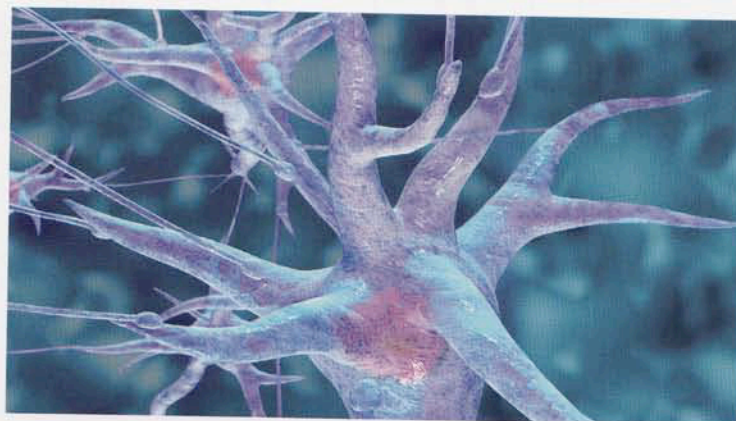


## Introduction

Whether organisms are extremely small or extremely large, it is imperative to understand their smallest functional units. These units are known as cells. Organisms range in size from a single cell to thousands of cells. To better understand plants and all the organisms around us, we must study their cells.

Look at the picture. Human nerve cells (neurons) are essential to our lives. Because of these cells, we are able to acknowledge and respond to our surroundings. Neurons are usually very efficient but sometimes things go wrong. Will a greater understanding and better treatment of conditions such as depression result from an improved comprehension of how these cells function?

This is an artist's impression of human nerve cells.



## 2.1 Cell theory

### Assessment statements

- 2.1.1 Outline the cell theory.
- 2.1.2 Discuss the evidence for the cell theory.
- 2.1.3 State that unicellular organisms carry out all the functions of life.
- 2.1.4 Compare the relative sizes of molecules, cell membrane thickness, viruses, bacteria, organelles and cells, using the appropriate SI unit.
- 2.1.5 Calculate the linear magnification of drawings and the actual size of specimens in images of known magnification.
- 2.1.6 Explain the importance of the surface area to volume ratio as a factor limiting cell size.
- 2.1.7 State that multicellular organisms show emergent properties.
- 2.1.8 Explain that cells in multicellular organisms differentiate to carry out specialized functions by expressing some of their genes but not others.
- 2.1.9 State that stem cells retain the capacity to divide and have the ability to differentiate along different pathways.
- 2.1.10 Outline one therapeutic use of stem cells.